

# Colloquium Notice

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## *Transport signatures of transient superfluids*

Recent advances in ultra-fast measurement in cold atoms, as well as pump-probe spectroscopy of  $K_3C_{60}$  films, have opened the possibility of rapidly quenching systems of interacting fermions to, and across, a finite temperature superfluid transition. However determining that a transient state has approached a second-order critical point is difficult, as standard equilibrium techniques are inapplicable. We show that the approach to the superfluid critical point in a transient state may be detected via time-resolved transport measurements, such as the optical conductivity. We leverage the fact that quenching to the vicinity of the critical point produces a highly time dependent density of superfluid fluctuations, which affect the conductivity in two ways. Firstly by inelastic scattering between the fermions and the fluctuations, and secondly by direct conduction through the fluctuations. The competition between these two effects leads to non-monotonic behavior in the time-resolved optical conductivity, providing a signature of the critical transient state

Monday

**February 26, 2018**

Starts at 12:15 PM

Coffee at 12:00 PM

Physics Conference Room, SB B326